



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,789	06/26/2003	Eric J. Bergman	54008.8026.US00	6887
45540	7590	10/14/2005	EXAMINER	
PERKINS COIE LLP/SEMITOOL PO BOX 1208 SEATTLE, WA 98111-1208			CARRILLO, BIBI SHARIDAN	
			ART UNIT	PAPER NUMBER
			1746	
DATE MAILED: 10/14/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,789

Applicant(s)

BERGMAN, ERIC J.

Examiner

Sharidan Carrillo

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08042005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 21-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 21-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 3-12, 21, and 23-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mehmandoust (US2001/0047595) in view of Ferrell et al. (5974689).

In reference to claims 1, 21, 31, and 33-34, Mehmandoust teaches a method of cleaning and drying a substrate comprising immersing the workpiece in an aqueous solution in a process vessel 194 (Fig.3), delivering an organic vapor of IPA in combination with hydrofluoroether to a region above the surface of the aqueous solution to create a reduced surface tension at the surface of the aqueous solution and causing

Art Unit: 1746

the liquid vapor interface to pass across the workpiece, pulling the aqueous solution off the workpiece to dry the workpiece (paragraphs 64, 88, 94, Fig. 10a).

In reference to claims 1, 6, and 26, Mehmandoust fails to teach sonic agitation. Ferrell et al. teach a method of cleaning and drying a workpiece using HFE or IPA. In col. 3, lines 105, Ferrell teaches the use of ultrasonic vibrations generated in the cleaning bath in order to enhance the removal of contaminants from the substrate surface. In the embodiments of Figs. 3A-3D, Ferrell teach ultrasonicing as the wafer is removed from the bath and dried with HFE.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Mehmandoust, to include ultrasonic vibration in the cleaning bath, as taught by Ferrell, for purposes of enhancing the removal of contaminants from the wafer surface. Additionally, the use of ultrasonic energy for particle removal is notoriously well known in the art.

In reference to claims 3 and 23, refer to paragraph 8 of Mehmandoust. In reference to claims 4, 8, and 24, refer to paragraph 84 of Mehmandoust. In reference to claims 5 and 25, refer to Fig. 16B. In reference to claim 7, refer to paragraph 86. In reference to claim 9, Mehmandoust fails to teach including at least one additive in the aqueous solution. Ferrell teaches that it is conventional to include chemical baths containing acids and bases as part of the cleaning process. It would have been obvious to a person of ordinary skill in the art to have modified the method of Mehmandoust to include acids and bases, as taught by Ferrell et al., which are conventionally used in the cleaning process. In reference to claims 10 and 28, refer to paragraph 8 of

Mehmandoust. In reference to claims 11 and 29, refer to paragraphs 73 and 86. In reference to claim 12, refer to paragraph 41. In reference to claim 27, the limitations are met since Mehmandoust teaches the same organic solvent as the claimed invention. In reference to claim 30, refer to paragraph 65.

4. Claims 2 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mehmandoust (US2001/0047595) in view of Ferrell et al. (5974689), as applied to claims 1, 3-12, 21, and 23-31, as described in paragraph 3 above, and further in view of Danese (6457478).

Mehmandoust et al. in view of Ferrell et al. teach the invention substantially as claimed with the step of irradiating the work piece. Danese teaches a method for treating a work piece with UV light. Additionally, col. 2, lines 20-30, teaches it is well known in the art to use UV light to remove surface contaminants from the wafer surface.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Mehmandoust et al. to include UV light, since Danese teaches these steps are conventionally and notoriously used for the treatment of semiconductor wafers. Additionally, it would have been within the level of the skilled artisan to have modified the method of Mehmandoust et al., to include UV, as taught by Danese, for purposes of enhancing removal of contaminants from the wafer surface.

Response to Arguments

5. Applicant argues that combining the teachings of Mehmandoust in view of Ferrell et al. Applicant argues that Mehmandoust teaches HFE in combination with a hydrophobic organic compound such as IPA. Applicant argues that Mehmandoust

Art Unit: 1746

teaches away from using HFE or IPA independently. Applicant further argues that it would not be obvious to combine the teachings of Mehmandoust with Ferrell because Mehmandoust teaches HFE and IPA and Ferrell teaches HFE.

Applicant's arguments are unpersuasive since Ferrell also teaches that HFE can be used solely or a mixture of HFE and one or more of other chemicals. In col. 6, lines 46-55, Ferrell suggests an HFE/IPA mixture. Additionally, applicant's arguments directed to HFE and IPA are not persuasive because they are not commensurate in scope with the instantly claimed invention which only requires an organic vapor.

6. Applicant further argues that Mehmandoust teaches a displacing effect of HFE instead of the limitation of pulling the aqueous solution off the workpiece. Applicant is directed to paragraphs 4, 88, and 94 which specifically teaches separation of water from the workpiece as the workpiece is pulled from the fluid in the bath. The limitations directed to the specific mechanism (i.e. displacement) is not persuasive because it is not commensurate in scope with the instantly claimed invention.

7. Applicant further argues that Ferrell does not teach continuing sonic agitation while the liquid vapor or aerosol interface passes across the workpiece surface. Applicant's arguments are not persuasive because in col. 3, lines 1-10, Ferrell teach subjecting the first liquid in the bath to ultrasonic vibrations. Ferrell does not limit the ultrasonic vibration of the immersion step. The examiner does agree that Ferrell et al. teach subjecting the workpiece to ultrasonic frequencies for most or all of the immersion time interval. However, in col. 3, lines 1-10, Ferrell also teaches subjecting the first liquid to ultrasonic vibrations and further teaches that the workpiece need not be

immersed in the liquid. In col. 1, lines 40-45, Ferrell teaches it is conventional and advantageous to use ultrasonic transducers in cleaning baths to further enhance the removal of contaminants. The additional teaching of applying ultrasonic vibration to the liquid when the workpiece is not immersed suggests that ultrasonic vibration can be used when the workpiece is immersed in the liquid as well as when the workpiece is being slowly withdrawn from the liquid in the bath and further suggests motivation to do so in order to further enhance cleaning and removal of contaminants. The applicant is invited to point out which passage of Ferrell specifically teaches no ultrasonics after immersion.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on Monday-Friday, 6:00a.m-2:30pm.

Art Unit: 1746

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sharidan Carrillo
Primary Examiner
Art Unit 1746

bsc

SHARIDAN
PRIMARY EXAMINER

SHARIDAN CARRILLO
PRIMARY EXAMINER